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44 (3) BCA-HC-3026

2022
(Held in 2023)

DATA STRUCTURE AND ALGORITHM

Paper : BCA-HC-3026

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer any six questions.

1. (a) Briefly explain memory representation of 2D arrays. Write address translation function for 2D arrays. 6
- (b) Each element of an array ARR [10] [10] requires 4 bytes of storage. Base address of ARR is 500. Determine the location of ARR [3] [5] when the array is stored as (a) row major, (b) column major. 2+2=4

Contd.

2. (a) Draw a before and after diagram and describe the main action of deleting a node from middle position of single linked list. 5
- (b) What is double linked list ? Explain the cases of deletion for double linked list. 5
3. (a) Explain stack overflow and underflow conditions. 5
- (b) Show the following postfix arithmetic expression evaluation in stack : 5
 $396 - \wedge 62 / 5 * + 73 \%$
4. (a) Explain the non-recursive function for preorder traversal. 5
- (b) Write the differences between BFS and NFS. 5
5. (a) What is binary search tree ? Write an algorithm to insert a node in binary search tree. 5
- (b) Describe the concept of binary search technique with a suitable example. 5

- (a) Sort the following data using selection sort :
35, 63, 31, 89, 70, 90, 92
5
- (b) What is a quicksort ? Give its algorithm.
How you can say that it is based on the concept of divide and conquer ?
Explain.
5
- (a) What is complexity of algorithm ? What are the cases for complexity of algorithm ?
5
- (b) What is asymptotic analysis of an algorithm ? What are asymptotic notations ?
5
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